NEW PROGRAM PROPOSAL: ***ACTION***
BHS IN DIAGNOSTIC IMAGING SCIENCES, **Agenda Item F-1-b**
UNIVERSITY OF LOUISVILLE **May 22, 2000**

Recommendation:

That the Bachelor of Health Science in Diagnostic Imaging Sciences proposed by the University of Louisville be approved and registered in CIP 51.0907 (Medical Radiologic Technology/ Technician).

Rationale:

- The proposed program provides advanced training in radiology and diagnostic imaging. It responds to needs in the health care community for individuals trained in the use of sophisticated, state-of-the-art imaging equipment.

- The program also addresses growing cost issues in health care by providing technicians qualified to fill several different positions. UofL's current associate degree program in Medical Radiologic Technology does not provide adequate multi-competency training and will be phased out following implementation of the proposed baccalaureate program.

- The proposed program supports UofL's goal to become a "premier, nationally-recognized metropolitan university" by responding to the changing needs of the health care field in general and UofL's medical service area in particular.

- Articulation and transfer agreements with the Kentucky Community and Technical College System, Morehead State University, and Northern Kentucky University support movement of students from related associate degree programs to the proposed baccalaureate program. Another agreement provides for transfer between UofL's program and a complementary baccalaureate program offered by MoSU.

An executive summary submitted by the University of Louisville is attached to this agenda item.

Staff Preparation by Barbara Cook

Introduction

Changes in reimbursement have dramatically influenced policy development within the healthcare environment. Healthcare providers continuously struggle with three prominent issues: quality patient care, cost containment, and personnel productivity. Fortunately, this three-fold concern can easily be minimized through the educational process.

The University of Louisville (UofL) School of Allied Health Sciences has developed a baccalaureate program in Diagnostic Imaging Sciences (DIS). The goal of the DIS program is to provide radiography students and other qualified healthcare professionals with additional education opportunities beyond the associate or certificate level. These opportunities include studies in advanced imaging modalities such as magnetic resonance imaging (MRI), computed tomography (CT), and diagnostic medical sonography (DM5). Program graduates will create a workforce of multi-skilled imaging professionals. This workforce will increase personnel productivity and efficiency within hospitals and medical clinics offering such services. Ultimately, the DIS program will promote quality improvement and facilitate cost containment within the healthcare delivery system.

Mission, Influence, Organization

Internal and external sources have facilitated change within the universit/s mission. The Kentucky Postsecondary Education Improvement Act of 1997 called for the University of Louisville to become a “premier, nationally, recognized metropolitan research university.” Clarifying statements adopted in 1997 by UofL address its commitments to undergraduate programs and professional programs. The School of Allied Health Science has established as part of its strategic plan a goal to “Develop innovative programs to meet evolving healthcare needs of the local community and the Commonwealth of Kentucky.’ Establishment of the DIS program is planned as an outcome of this goal. Implementation of this program will give the school a pathway to access opportunities for collaborative research projects as well as for participation in distance education activities.

Program Description

The DIS curriculum blends a liberal arts foundation with both basic and clinical medical imaging sciences content. The present radiography curriculum will serve as a foundation for preparing students to enter the advanced imaging concentrations. Clinical education will be integrated with the didactic courses so that students receive hands-on experience with patients in routine and emergency situations.

After completing the DIS curriculum with appropriate documentation of clinical experience, the students will be eligible to take two (2) national board certification examinations. Examples of dual certification include radiography coupled with CT, radiography coupled with MRI, and radiography coupled with DMS.

On August 6, 1999 articulation transfer cooperation agreements were discussed among representatives from Morehead State University, Northern Kentucky University, the Kentucky Community and Technical Colleges System (KCTCS), and the University of

Louisville. Advanced imaging concentrations will be made available through the DIS program to students from these institutions through such agreements once they are negotiated and officially approved. Students entering from other established radiography programs located in hospitals, KCTCS institutions, as well as other state colleges or universities will be able to transfer into the UofL baccalaureate program under transfer guidelines in force at that time.

In addition to regular classroom offerings, the Diagnostic Imaging Sciences curriculum will be delivered through a computer-generated distance learning environment. Also, clinical resources not available within a student's own community may be made available in other designated areas. Faculty members from related institutions will develop and share numerous instructional modules. Through a distance learning approach, instructional resources will be shared by all faculty members.

Supportive Data

Employment prospects for DIS graduates are excellent. According to the Pew Health Professions Commission, "The changing health care delivery system is creating a demand for allied health professionals who offer a wider range of clinical skills.. and more flexibility in adapting to practice settings than they currently have. A major obstacle to preparing the allied health workforce to face these upcoming challenges is lack of career ladders allowing individuals to expand and diversify their array of skills." Several formal surveys have determined that the level of student interest in a baccalaureate program in imaging sciences is high—that respondents preferred to graduate with multi-competencies.

Although there is one (1998) CPE-approved baccalaureate degree program in imaging sciences available at Morehead State University, the UofL DIS program will not be an unnecessary duplication of that program. Located in very different environments, both programs will offer basic professionals curriculum components, and the UofL program will complement the Morehead program in imaging study areas not offered through that program but available in Louisville.

Other out-of-state institutions offer programs similar to the one being proposed by UofL. For example, there are 20 medical imaging baccalaureate programs in the U.S. and several institutions (Thomas Jefferson University, University of North Carolina at Chapel Hill, and University of Alabama at Birmingham) offer baccalaureate programs similar to the one proposed. The major similarity of these programs is their goal to produce graduates with multiple skills in advanced imaging technology. The major difference among the programs is the availability of clinical education resources needed to teach numerous advanced imaging technologies.

Using interactive video, web-based instruction, and satellite or cable teleconferencing, state postsecondary institution students enrolled in radiography programs will have an opportunity to access and complete portions of the core didactic curriculum in their local communities. This distance education model will be delivered primarily through the Kentucky Commonwealth Virtual University (KCVU). Additionally, students may elect to perform their clinical education on the local level.

Resources

The University of Louisville Health Sciences Center campus has adequate classroom and laboratory space to accommodate instructional and research activities. The University has six classrooms
equipped for distance learning, one of which is housed on the Health Sciences Center campus. Tuition-based projected enrollment, with potential increased enrollment and internal reallocation of resources, will provide the needed support to implement and sustain the program.

Definition of Terms

Because the differences between the various radiologic sciences modalities discussed in the proposal may be obscure to a lay audience, a brief definition of terms follows.[1]

Radiography. Two general types of x-ray procedures—radiographic examinations producing fixed photographic images and fluoroscopic examinations producing dynamic images revealed on a fluoroscope or a television monitor--are involved in radiography. An x-ray is “a high-energy electromagnetic wave.... X-rays are produced by bombarding a target in a vacuum tube with high-velocity electrons” (2171-2).

Ultrasound. Ultrasonography(sonography) is a modality that requires special equipment and is used to “produce an image or photograph of an organ or tissue. Ultrasonic echoes are recorded as they strike tissues of different densities.... (Ultrasound is an) “inaudible sound in the frequency range of approximately 20,000 to 10 billion (1 0~) cycles per second. Ultrasound has different velocities in tissues that differ in density and elasticity from others. This property permits the use of ultrasound in outlining the shape of various tissues and organs” (p. 2069).

Computed tomography. Tomography is “any of several noninvasive special techniques of roentgenography designed to show detailed images of structures in a selected plane of tissue by blurring images of structures in all other planes.... (CT is a) “tomography in which transverse planes of tissue are swept by a pinpoint radiographic beam and a computerized analysis of the variance in absorption produces a precise reconstructed image of that area” (p. 2005).

Magnetic resonance imaging. In MRI, the body is placed in a magnetic field, and the body part is exposed to an oscillating magnetic field in the radiofrequency region of the electromagnetic spectrum. “When certain atomic nuclei with an odd number of protons or neutrons or both are subjected to a strong magnetic field, they absorb and re-emit electromagnetic energy. Analysis of the net magnetization vectors deflection by application of a radiofrequency pulse provides image information” (1157).

[1]Material in quotation marks is from Taber’s Cyclopedic Medical Dictionary (17”’ ed.) edited by Clayton L. Thomas, 1993. Philadelphia: F. A. Davis. Page numbers for individual quotations are enclosed in parentheses at the end of the defining statement.